UNIVERSITY OF CALIFORNIA

EPARTMENT OF BACTERIOLOGY
BERKELEY 4, CALIFORNIA

Nov. 30, 1950

Dear Joshua -

Re tested liquid medium: I regret that we have no personal experience, since the sort of problem you're interested in has never arisen. However, Seymour Hutner (who has chided me for the inadequacy of our synthetic media) recommends (Proc. Am. Phil. Soc. 94, 152, 1950):

Ethylenediaminetetraacetic acid 0.05 g.

K_2HPO_4 0.02 g.

$MgSO_4 \cdot 7H_2O$ 0.08 g.

NH_4Cl (NH_4NO_3 preferable, I think) 0.02 g.

I would recommend a higher pH: 7.5, if precipitation is not a problem

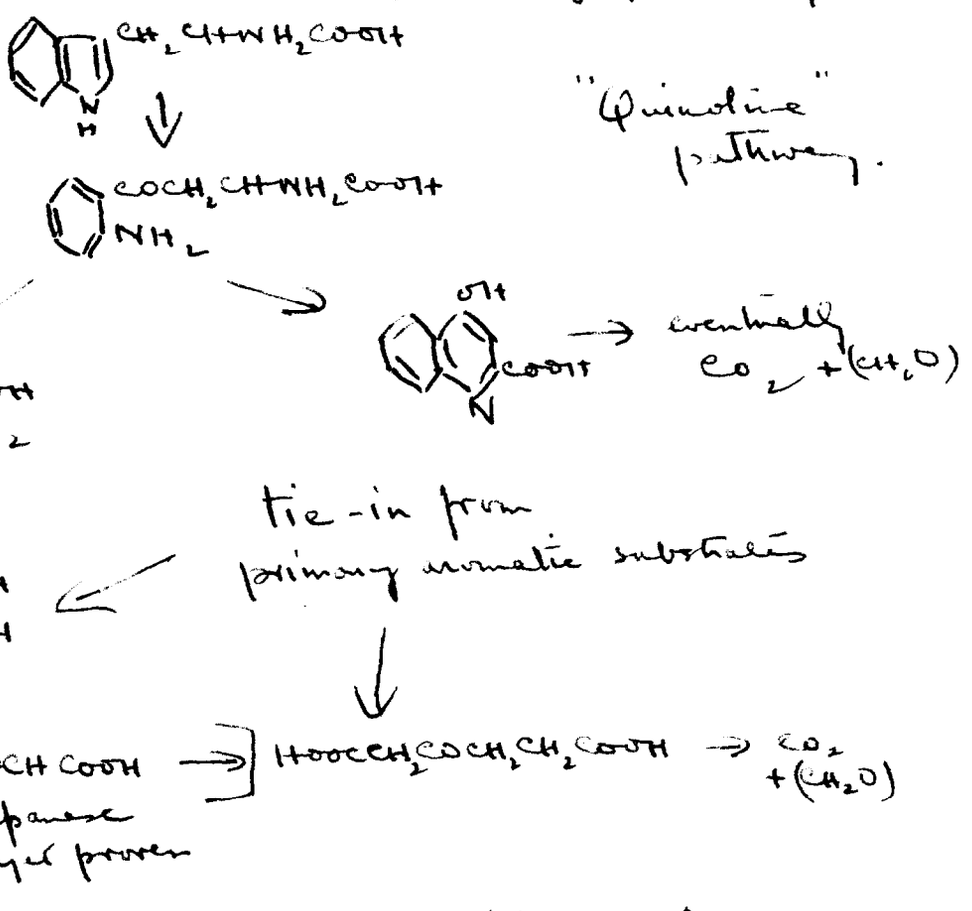
Zn	5.0 mg.	Fe	1.0 mg.
Ca	2.0 mg.	Mo	0.6 mg.
B	2.0 mg.	Cu	0.4 mg.
Mn	1.4 mg	Co	0.4 mg

To pH 6.6 - 6.9 c̄ KOH: dist. H_2O to 100 ml.

He says this gives abundant growth, with a suitable C-source, of many strains that grow badly in the sort of crude media we use.

No chance of a paper on UV/adaptation at the moment, as I am up to my ears in tryptophane metabolism with Hayaishi, who leaves for Kornberg's lab in January. Also, I want to see what Giese has in press on UV/adaptation in yeast; he may have anticipated most of our points. Shirley Gunter has been using it to study the sequence of adaptation in metabolic pathways, with dull & expected results; the intermediates are adapted to at much the same rate as the primary substrate. All this shows is that v. small amounts of substrate are needed to start induction.

The tryptophan story is fascinating. In pseudomonads, there are 2 radically distinct pathways, diverging at kynurenine



Some stx in the aromatic pathway have a block below anthranilic, which accumulates in yields of ± 80 %. Despite this very severe block, they are fully adapted to catechol, the small leak thru the block being sufficient to give complete activation of the later adaptive systems. In 25 tested stx the pathway is either/or; no "mixed" cases. But we have one extraordinary strain which accumulates in quantitative yield from tryptophan a mixture (ratio variable) of kynurenic and anthranilic acids, there being an apparent absolute double block. There is also one other aberrant strain with an early absolute block that accumulates an indole derivative, probably 3-OH indole, and is thus [illegible] close to a reversal of the biosynthetic pathway. So much for Kear's idea that degradative pathways should be the reverse of synthetic ones. We have now enzymes cell-free: kynureninase (a pyridoxal-P enzyme that cleaves to alanine + anthranilic), the system oxidizing tryptophan → Kynurenine, + the catechol-oxidizing system. McElwain's technique of alumina grinding has proved a godsend in making preparations of the enzymes, since some,

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notably tryptophan oxidase, are completely wrecked by sloppy drying et al. Alumina grinding is quick, easy & miraculous — see description in J. Gen. Microbiol. 1948.

Did I write to you about the possibility of a visit to Madison in Feb? I'd like to come after the program committee meeting of the SAB in Iowa City. It would help if you could dig up a small honorarium for a seminar, but this won't be vital unless I'm broker than I expect to be by then.

Best wishes

Roger